Claims

[1] A sliding mechanism apparatus comprising:

a) a guide member;

b) a slider member coupled to the guide member so as to enable to slide thereon in a linear direction;

c) a first torsion spring including a first coil wound in a circular form and two first arms extended from both ends of the first coil by a certain length, wherein the first torsion spring is disposed in a space between the slider member and the guide member, the end of one of the two first arms is connected to a first position placed near a left edge of the guide member, and the end of the other first arm is connected to a second position placed within a right half area of the slider member; and

d) a second torsion spring including a second coil wound in a circular form and two second arms extended from both ends of the second coil by a certain length, wherein the second torsion spring is disposed in a space between the slider member and the guide member, the end of one of the two second arms is connected to a third position placed near a right edge of the guide member, and the end of the other second arm is connected to a fourth position placed within a left half area of the slider member.

[2] The sliding mechanism apparatus according to claim 1, wherein a distance between the first position and the second position is substantially the same as a distance between the third position and the fourth position.

[3] The sliding mechanism apparatus according to claim 1, wherein the guide member formed of a first rectangular plate is provided with a first and second guide rail extended along a left and right edge on the top face of the first rectangular plate and having a height so as to allow for a free movement for the first and second torsion spring, the first and second guide rail is provided with a first and second guide rail groove extended along the outer lateral face thereof, and a first connection hole and a second connection hole are formed respectively in the first position of the first guide rail and the third position of the second guide rail; and wherein the slider member formed of a second rectangular plate is provided with a first and second rail formed along a left and right edge on the bottom face of the second rectangular plate so as to be engaged with the first and second guide rail groove respectively, and a third and fourth connection hole is formed respectively in the second and fourth position of the second rectangular plate such that a bent end portion of the first and second torsion spring is inserted respectively into the third and fourth connection hole.

[4] The sliding mechanism apparatus according to claim 1, wherein the guide member is provided with a first and second guide bar extended along both lateral faces of a first rectangular plate, and a first connection hole and a second connection hole are formed in the first position and the third position placed in both edges of the first rectangular plate; and wherein the slider member is provided with a coupling hand formed in a left and right edge of a second rectangular plate so as to slidably grip the first and second guide bar, and a third and fourth connection hole is formed respectively in the second and fourth position placed in the second rectangular plate.

[5] The sliding mechanism apparatus according to any one of claims 1 to 4, wherein the slider member and the guide member are provided, in the outer face thereof, with a plurality of screw holes for attaching respectively a first and second component of an appliance using a screw.

[6] The sliding mechanism apparatus according to any one of claims 1 to 4, wherein the slider member and the guide member constitute part of a first and second component of an appliance such that the first and second components of the appliance can be opened and closed relatively to each other in a sliding mode.

[7] A sliding mechanism apparatus comprising:

a) a guide member including a rectangular plate having a first and second guide dam along both longitudinal edges thereof, and a first and second guide bar installed in parallel to the first and second guide dam;

b) a slider member coupled with the guide member so as to enable a relative linear movement with respect to each other, wherein the slider member is provided with a first and second slide-coupling hand formed to the left and right thereof, the first and second slide-coupling hand including a first and second guide hole inserted respectively into the first and second guide bar and a first and second rail engaged with the first and second guide dam provided in the left and right side so as to face each other;

c) a first torsion spring including a first coil wound in a circular form and two first arms extended from both ends of the first coil by a certain length, wherein the first torsion spring is disposed in a space between the slider member and the guide member, the end of one of the two first arms is connected to a first position placed near a left edge of the guide member, and the end of the other first arm is connected to a second position placed within a right half area of the slider member; and

d) a second torsion spring including a second coil wound in a circular form and two second arms extended from both ends of the second coil by a certain length, wherein the second torsion spring is disposed in a space between the slider

member and the guide member, the end of one of the two second arms is connected to a third position placed near a right edge of the guide member, and the end of the other second arm is connected to a fourth position placed in the slider member.

[8] The sliding mechanism apparatus according to claim 7, wherein the first and second guide dam are structured in such a manner i) that the dam is protruded along both lateral edges of the rectangular plate in the form of a continuous straight line, or ii) that the dam is divided into an upper portion and a lower portion along both lateral edges of the rectangular plate such that the upper portion is protruded rearwards of the lateral face to thereby support a bottom face of the first and second slide-coupling hand and the lower portion is protruded frontward of the lateral face to thereby be inserted into the first and second rail.

[9] The sliding mechanism apparatus according to claim 7, wherein the second position and the fourth position are placed respectively in a left half area and a right half area of the slider member.

[10] The sliding mechanism apparatus according to claim 7, wherein the first and second guide hole for the first and second guide bar to be inserted thereinto is provided with a cylinder-shape bearing in the inner wall thereof so as to allow for a smooth sliding movement of the guide bar, and the first and second guide bar each is provided with a buffer rubber at both end portions thereof such that the buffer rubber is hit with an end of the bearing when the slider member slides and hits the top face or the bottom face of the guide member, thereby alleviating sliding impact between the slider member and the guide member.

[11] An appliance integrated with a sliding mechanism apparatus, the sliding mechanism apparatus including a guide member and a slider member engaged with the guide member so as to slide linearly thereon, wherein a resilient contact plate is fixed to a certain desired area in an inner face of at least one of the guide member and the slider member, the slider member and the guide member remain in an electrical contact with each other by means of the contact plate even when in a relative sliding motion, and at least one of the guide member and the slider member is electrically connected to a reference potential point of the device.

[12] A sliding mechanism apparatus in which a slider member slides linearly on a guide member including a rectangular plate, the mechanism comprising:

a) a first and second guide bar installed in parallel along both lateral edges of the guide member; and

b) a first and second slide-coupling hand positioned respectively in a left and right edge of the slider member, and including a first and second guide hole into which the first and second guide bar is inserted respectively so as to allow for a

sliding movement of the slider member.

[13] The sliding mechanism apparatus according to claim 12, wherein the first and second guide bar are attached to both lateral edges of the rectangular plate in such a way to be closely contacted thereto or spaced apart therefrom, and the first and second guide hole are opened at one end thereof so as to wrap around a certain portion of the first and second guide bar.

[14] The sliding mechanism apparatus according to claim 13, wherein a guide dam is provided in the rectangular plate along both lateral edges thereof near the first and second guide bar, and a guide rail corresponding to the guide dam is provided near the first and second guide hole, such that the guide dam and the guide rail are engaged with each other to perform a guiding function.

[15] A sliding mechanism apparatus comprising:

a) a guide member formed of a plate material having generally a rectangular shape;

b) a slider member engaged with the guide member so as to enable a relative linear sliding movement;

c) a variable link fixed to a central position of the slider member in such a way that the center portion of the link is rotatably fixed through a link shaft thereof, the variable link having two arms extended to the left and right from the center potion thereof by a certain length;

d) a first torsion spring including a first coil wound in a circular form and a first fixed and first variable arm extended from both ends of the first coil by a certain length, wherein the first torsion spring is placed between the slider member and the guide member, a fixed end of the first fixed arm is connected near a right edge of one of the guide member and slider member, and a fixed end of the first variable arm is pivotably connected to the left end portion of the variable link; and

e) a second torsion spring including a second coil wound in a circular form and a second fixed and second variable arm extended from both ends of the second coil by a certain length, wherein the second torsion spring is placed between the slider member and the guide member, a fixed end of the second fixed arm is connected to a left edge of the other one of the guide member and the slider member, and a fixed end of the second variable arm is pivotably connected to the right end portion of the variable link.

[16] The sliding mechanism apparatus according to claim 15, wherein the guide member and the slider member are slidably engaged in such a manner i) that the rectangular plate of the guide member is provided with a first and second guide dam at the left and right side thereof, and the slider member is provided with a

first and second rail at the left and right side thereof so as to slidably engaged with the first and second guide dam; and/or ii) that the guide member is provided with a first and second guide bar installed in parallel at the left and right side of the rectangular plate, and the slider member is provided with a first and second guide hole to be inserted respectively into the first and second guide bar.

[17] The sliding mechanism apparatus according to claim 16, wherein the first and second guide dam is protruded along both lateral edges of the rectangular plate in the form of a straight line having a "□" shape cross-section, and the first and second rail is protruded only in a front and rear portion thereof excepting an intermediate portion thereof so as to be engaged with the first and second guide dam.

[18] The sliding mechanism apparatus according to claim 17, wherein the variable link is further provided with a pivot guide projection having a first slant face and a second slant face formed at both sides of the link shaft so as to face each other, the first slant face rotates contacted with the variable arm of the first torsion spring, and the second slant face rotates contacted with the variable arm of the second torsion spring.

[19] The sliding mechanism apparatus according to claim 17, wherein the variable arms of the first and second torsion spring, which are fixed to the variable link, are bent outwardly, thereby further expanding an angle between the arms of the first and second torsion spring.

[20] A sliding mechanism apparatus comprising:

a) a guide member formed of a plate material having generally a rectangular shape;

b) a slider member engaged with the guide member so as to enable a relative linear sliding movement; and

c) a cylinder-type spring disposed between the slider member and the guide member and structured such that the length thereof can be extended and retracted resiliently, wherein both ends of the cylinder-type spring are pivotably connected to the left and right side edge or the right and left side edge of the guide member and the slider member.

[21] The sliding mechanism apparatus according to claim 20, wherein the cylinder-type spring comprises a cylinder connected to one of the guide member and the slider member, a coil spring housed inside the cylinder, and a rod resiliently supported by the coil spring and connected to the other one of the guide member and the slider member.

[22] The sliding mechanism apparatus according to claim 20, wherein the cylinder-type spring comprises a cylinder connected to one of the guide member and the

slider member, a coil spring housed inside the cylinder, a rod resiliently supported by the coil spring, and a variable link rotatably connected to the other one of the guide member and the slider member through a link shaft positioned in the center of the variable link and pivotably connected to the rod at a position spaced apart from the link shaft in such a way as to move with the rod.

[23] A sliding mechanism apparatus comprising:

a) a guide member formed of a plate having generally a rectangular shape ;

b) a slider member engaged with the guide member so as to enable a relative linear sliding movement;

c) a first cylinder-type spring disposed between the slider member and the guide member and structured such that the length thereof can be extended and retracted resiliently, wherein both ends of the first cylinder-type spring are pivotably connected respectively to a first position placed near a right edge of the guide member and to a second position placed within a left half area of the slider member; and

d) a second cylinder-type spring disposed between the slider member and the guide member and structured such that the length thereof can be extended and retracted resiliently, wherein both ends of the second cylinder-type spring are pivotably connected respectively to a third position placed near a left edge of the guide member and to a fourth position placed within a right half area of the slider member.

[24] The sliding mechanism apparatus according to claim 23, wherein the first and second cylinder-type spring each comprises a cylinder connected to one of the guide member and the slider member, a coil spring housed inside the cylinder, and a rod resiliently supported by the coil spring and connected to the other one of the guide member and the slider member.

[25] The sliding mechanism apparatus according to claim 23, wherein the first and second cylinder-type spring each comprises a cylinder connected to one of the guide member and the slider member, a coil spring housed inside the cylinder, a rod resiliently supported by the coil spring, and a variable link rotatably connected to the other one of the guide member and the slider member through a link shaft positioned in the center of the variable link and pivotably connected to the rod at a position spaced apart from the link shaft in such a way as to move with the rod.

[26] An appliance integrated with a sliding mechanism apparatus, the appliance comprising:

a) a main body including at least one coupling hand, the coupling hand being protruded frontward and having a guide hole in a sliding direction; and

b) a cover having a sliding space depressed in the rear face thereof so as to slidably accommodate the coupling hand of the main body, wherein the sliding space is provided with at least one guide bar, which is inserted into the guide hole of the coupling hand to thereby guide sliding of the main body.

[27] The appliance according to claim 26, wherein the coupling hand and the guide bar are formed, in pairs, in the left and right portion of the main body and the cover so as to correspond to each other.

[28] The appliance according to claim 27, wherein the pair of coupling hands is integrally formed near a left and right edge of a slider member having a plate-like form, and the slide member is fixed to a front face of the main body.

[29] The appliance according to claim 27, wherein the pair of coupling hands is integrally formed, in pairs, in the left and right portion of the front face of the main body so as to be spaced apart from each other by a certain desired distance.

[30] The appliance according to claim 26 or 27, wherein the cover is provided with a guide rail in the sliding space of the rear face thereof so as to be protruded along the sliding direction, and the main body is provided with a guide dam formed at a lateral face of the coupling hand thereof so as to be engaged with the guide rail.

[31] The appliance according to claim 30, wherein the guide rail is comprised of a plurality of guide rail sections protruded at regular intervals along both lateral faces of the sliding space, and a spacing between the guide rail sections are configured such that the coupling hand can be inserted from the front side.

[32] The appliance according to claim 27, wherein at least one torsion spring is disposed in the sliding space, and one end of the torsion spring is pivotably coupled to the main body and the other end thereof is pivotably coupled to the cover.

[33] The appliance according to claim 27, wherein a fixing hole is formed in an upper and lower inner wall of the sliding space so as to be opened inwards of the sliding space, and both ends of the guide bar are inserted and fixed into the upper and lower fixing hole respectively.

[34] The appliance according to claim 33, wherein a rubber packing is interposed between the fixing hole and the guide bar.

[35] The appliance according to claim 34, wherein either the upper fixing hole or the lower fixing hole is formed in a separate finishing plate, and the finishing plate is mounted in the upper portion or the lower portion of the sliding space.

[36] An appliance integrated with a sliding mechanism apparatus, the device comprising:

a) a main body having buttons and at least one straight sliding space in a sliding direction, the sliding space being formed in either the right or left side or both

sides of the front face of the main body along the peripheral area thereof, a guide bar being mounted in the sliding space along the sliding direction; and

b) a cover having at least one coupling hand in the rear face thereof, the coupling hand being received inside the sliding space of the main body and having a guide hole formed so as to be inserted into the guide bar, which thereby is slid and guided.

[37] The appliance according to claim 36, wherein the sliding space is provided with a guide rail protruded along the sliding direction, and the coupling hand is provided with a guide dam formed so as to be engaged with the guide rail.

[38] The appliance according to claim 36 or 37, wherein the sliding space is formed, in pairs, in the left and right side of the main body in such a way to be depressed to have a "U" shaped cross-section, and the coupling hand is formed, in pairs, at a position corresponding to the sliding space, the lateral face of the coupling hand being placed inwards of the lateral face of the cover.

[39] The appliance according to claim 36 or 37, wherein the sliding space is formed, in pairs, in a left and right side of the main body in such a way to be depressed to have an "L" shaped cross-section and be opened to the left and right lateral face, and the coupling hand is formed, in pairs, at a position corresponding to the sliding space, the lateral face of the coupling hand being aligned with the lateral face of the cover.

[40] A slider-type appliance having a main body and a cover to be opened and closed while sliding on the main body, wherein at least one straight sliding space is provided in a sliding direction along at least one of the left and right lateral faces of one of the main body and the cover, and a guide bar is installed in the sliding space along the sliding direction; and wherein the other one of the main body and the cover is received inside the sliding space while wrapping around a certain portion of the lateral face of the one of the main body and the cover, and at least one coupling hand is provided in the rear face thereof, the coupling hand having a guide hole formed so as to be inserted into the guide bar and slidably guided.

[41] The appliance according to claim 40, wherein the sliding space is formed, in pairs, in the left and right thereof in such a way to be depressed so as to have a "□" shaped cross-section, and the coupling hand is formed, in pairs, in a position corresponding to the sliding space in such a way to enclose the pair of sliding spaces.

[42] The appliance according to claim 41, wherein the sliding space is provided with a guide rail formed along the sliding direction, and the coupling hand is provided with a guide dam formed to be engaged with the guide rail.